84. (Amended) The system of claim 66, wherein the mark placement on the point in the multidimensional map comprises means for storing the coordinates of the point corresponding to the target string or properties of the comparison string in memory, a database or a table.

85. (Amended) The system of claim 66, wherein the mark placement on the point in the multidimensional map comprises means for placing a mark on a point in a video display by changing some graphical property of the corresponding pixel, such as color.

86. (Amended) The system of claim 66, further comprising:

means for examining a plurality of subregions of the multidimensional map with higher resolution.

REMARKS/ARGUMENTS

Claims 31-96 remain in this application. Claims 31, 64, 65 and 66 are independent claims. Claims 31, 32, 35, 36, 37, 38, 40, 50, 51, 64, 65, 66, 67, 70, 71, 72, 73, 75, 84, 85 and 86 have been amended.

Claims 31, 64, 65 and 66 were amended to state "a plurality of target strings" instead of "one or more target strings" in order to avoid a future indefiniteness rejection. The words "a plurality of" were inserted into the claims, and the words "one or more" was deleted from the claims.

Claim 65 was also amended to correctly state "scoring" instead of "comparing." The word "scoring" was inserted into the claim, and the word "comparing" was deleted from the claim.

Claims 31, 36, 40, 49, 50, 51, 64, 65, 66, 71, 75, 84, 85 and 86 were amended to state "multidimensional map." The word "multidimensional" was inserted into the claims in order to clarify that the map is a multidimensional space, not a database.

Claims 31, 32, 35, 36, 37, 38, 64, 65, 66, 67, 70, 71, 72 and 73 were amended to state "mathematically generating." The word "mathematically" was inserted into the claims to clarify the

generation process. The generation of a comparison string from a point in a multidimensional map is done mathematically.

Claim Rejections Under 35 U.S.C. § 112

Claims 31, 64, 65 and 66 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner states that the claimed invention is an endless loop or unbounded process, "repeating the steps of generating and comparing for a plurality of comparison strings."

The applicant respectfully disagrees. A "plurality" is a finite number. Thus, "repeating the steps of generating and comparing for a plurality of comparison strings" is not an endless loop. Claims 31, 64, 65 and 66 have each been amended to change "one or more target strings" to "a plurality of target strings," so that the "one or more" target strings do not cause an endless loop or unbounded process. Thus, to paraphrase the looping procedure, for each of the plurality of target strings, the steps of generating and comparing are repeated for a plurality of comparison strings. These two loops form a nested loop, not an endless loop or unbounded process.

Rejections Under 35 U.S.C. § 103

Claims 31-32, 35-49, 59-63, 64, 65, 66-67, 70-73, 74-83, 84 and 93-96 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,141,657 issued to Rothberg et al. (hereinafter Rothberg). The applicant respectfully traverses the rejection by demonstrating below that Rothberg does not anticipate the applicant's claimed invention.

Rothberg teaches a method and apparatus for identifying classifying or quantifying DNA sequences in a sample without sequencing. Rothberg teaches fragmenting a DNA sequence, sorting the fragments, and analyzing the fragments together with a DNA sequence database.

The present invention, on the other hand, provides a modeling technique used for data analysis. Datasets (target strings) are first modeled, and the geometry of these models (comparison

strings) on the surface upon which they reside and the structure of the models themselves can then be used to highlight and/or visualize patterns within the comparison strings, as well as between comparison strings. The modeling technique is performed by mathematically generating a comparison string calculated from a point in a multidimensional map. "A region R is selected that can serve as the domain of an iterative function. The iterative algorithm calculates the comparison string from a point p in some region R. Preferably, the region R is in the complex plane corresponding to the area in and around the Mandelbrot Set." (Specification, page 3, line 33 and page 4, lines 1-3). The comparison string is not one of the target strings or a pattern in one of the target strings. Similarly, the comparison string is not a nucleotide sequence or a pattern in a nucleotide sequence.

Further, the map is a multidimensional space, not a database in the present invention. The point in the multidimensional map has coordinates, and is thus not a target string, a pattern in a target string, a nucleotide sequence, or a pattern in a nucleotide sequence. Preferably this point is a point in any set of points that can serve as the domain of an iterative function. This iterative function is a mathematical algorithm. Further, preferably this set of points is in the complex plane corresponding to an area in and around the Mandelbrot Set. A plurality of target strings comprising datasets, such as DNA sequences, are then compared to the generated comparison string. Again, the comparison string is not one of the target strings. As a result of the comparison, if the score or some other property corresponding to the point meets some relevant criteria, such as some minimum degree of similarity to the target string, a mark is placed on the point in the visual display. Marked points can then be used to highlight and/or visualize similarities or differences between the target strings.

Claim 31 is an independent claim. Claim 31 requires mathematically generating from a point in the multidimensional map a comparison string comprising a dataset. The Examiner suggests that Rothberg discloses sample sequence comprising a plurality of nucleic acids of database sequence is generated by recognition means. (col. 16, lines 52-67, col. 17, lines 1-20, col. 63, lines 24-32). The applicant respectfully disagrees that these lines state what the Examiner

suggests. Instead, Rothberg teaches that a sample sequence is probed by recognition means to recognize target nucleotide subsequences, from which signals are created and sent to a programmable apparatus for analyzing the signals. (col. 16, lines 49-55). Rothberg teaches that the signals created from the nucleotide sequences are then compared to sequences in a database. (col. 17, lines 1-3). Basically, fragments of or patterns in sequences are generated from a sample sequence. The applicant respectfully disagrees that this is the same as some of the requirements of Claim 31. The Examiner suggests that the "target nucleotide subsequences" are analogous to the "comparison" strings of the present invention. The present invention does not generate comparison strings from nucleotide sequences. Comparison strings are neither a sample of nucleotide sequences, nor a nucleotide sequence, nor signals generated from nucleotide sequences. Further, Claim 31 requires a multidimensional map, which Rothberg does not teach. Thus, Rothberg does not teach mathematically generating from a point in a multidimensional map a comparison string, as required by Claim 31.

Claim 31 also requires comparing a number of the target strings with the comparison string to determine for each target string if a mark should be placed on the point in the multidimensional map corresponding to the comparison string. The Examiner suggests that Rothberg teaches recognition means causing comparing device to find any matches between one or more pattern from sample sequence with the target sequence such as DNA sequence. (col. 17, lines 20-36; also see fig. 9 and col. 64, lines 40-55). The applicant respectfully disagrees that these lines state what the Examiner suggests. Instead, Rothberg teaches a comparing device, which compares the actual signals from the generated target nucleotide subsequences to patterns of signals in a database. (col. 17, lines 23-30). The applicant also respectfully disagrees that this is the same as some of the requirements of Claim 31. Claim 31 does not require generating comparison strings from nucleotide sequences. Therefore, it follows that Claim 31 does not require comparing subsequences to patterns of subsequences or signals to patterns of signals, as in Rothberg. Again, Claim 31 requires a multidimensional map, which Rothberg does not teach. Thus, Rothberg does not teach comparing a number of the target strings with the comparison string to determine for each target

string if a mark should be placed on a point in the multidimensional map corresponding to the comparison string, as required by Claim 31.

The Examiner states that Rothberg does not clearly indicate a point in the map. The Examiner suggests that Rothberg discloses a pattern of signal as a point for the basis of comparison of sample and target sequences (col. 57, lines 20-36). The applicant respectfully disagrees that these lines state what the Examiner suggests. Col. 57, lines 20-36 make no mention of this subject, but instead discusses the intricacies of amplifying cDNA fragments (col. 55, lines 22, 23). Applicant believes Examiner meant col. 17, lines 20-36. In these lines, patterns of signals are generated by probing a sample of nucleotide sequences. As discussed above, the "point" in the present invention is a point in a multidimensional map. The point has coordinates. The point is not a pattern of signals from a nucleotide sequence, as in Rothberg. Further, Rothberg does not teach maps or points in maps. Thus, Rothberg does not teach the "point in a multidimensional map" as required by Claim 31.

Claim 31 also requires repeating the steps of mathematically generating and comparing for a plurality of comparison strings. The Examiner suggests that Rothberg teaches these elements of Claim 31. (col. 65, lines 1-32). The applicant respectfully disagrees. Rothberg does not teach a comparison string, and thus does not teach generating a comparison string or comparing a comparison string to target strings. Therefore, Rothberg does not teach repeating the steps of mathematically generating and comparing for a plurality of comparison strings, as required by Claim 31.

Rothberg does not teach mathematically generating from a point in the map a comparison string comprising a dataset, as required by Claim 31. Further, Rothberg does not teach comparing a number of the target strings with the comparison string to determine for each target string if a mark should be placed on the point in the multidimensional map corresponding to the comparison string. Further, Rothberg does not teach the steps of mathematically generating and comparing for a plurality of comparison strings, as required by Claim 31. For at least these reasons, the independent Claim 31 is allowable over the teachings of Rothberg.

Claim 32 is dependent on the independent Claim 31. Claim 32 requires that in the step of mathematically generating the comparison string the comparison string is calculated from a point in any set of points that can serve as the domain of an iterative function. The Examiner suggests that Rothberg teaches the elements of Claim 32. (col. 65, lines 1-34). The applicant respectfully disagrees. Rothberg teaches iteration as repeating a series of steps. Essentially, Rothberg teaches the steps of fragmenting the DNA sequence, sorting the fragments and testing the fragments. (col. 65, lines 1-33). In the present invention, on the other hand, the iteration is an iterative mathematical algorithm, or a mathematical algorithm that repeats. Thus, Rothberg does not teach that in the step of mathematically generating the comparison string the comparison string is calculated from a point in any set of points that can serve as the domain of an iterative function, as required by Claim 32. For at least this reason, the dependent Claim 32 is allowable over the teachings of Rothberg.

Claim 35 is dependent on the independent Claim 31. Claim 35 requires that the step of mathematically generating the comparison string further comprises transforming the numbers of the comparison string to have values within a set of interest. The Examiner suggests that Rothberg teaches the elements of Claim 35. (col. 16, lines 48-67 and col. 17, lines 1-21). As discussed above, Rothberg does not teach a comparison string generated by a mathematical iterative function. Rothberg instead generation of nucleotide subsequences and signals detected from these subsequences. There is also no discussion of transformation of numbers in these lines of Rothberg. Thus, Rothberg does not teach that the step of mathematically generating the comparison string further comprises transforming the numbers of the comparison string to have values within a set of interest, as required by Claim 35. For at least this reason, the dependent Claim 35 is allowable over the teachings of Rothberg.

Claim 36 is dependent on the independent Claim 31. Claim 36 requires that the step of mathematically generating the comparison string further comprises laying a grid over the points in the multidimensional map. The Examiner suggests that Rothberg teaches the elements of Claim 36. (col. 83, lines 52-67 and col. 84, lines 1-5). The applicant respectfully disagrees. As discussed above, Rothberg does not teach a map or point in a multidimensional map. It follows that Rothberg

does not teach laying a grid over points in a map. Thus, Rothberg does not teach that the step of mathematically generating the comparison string further comprises laying a grid over the points in the multidimensional map. For at least this reason, the dependent Claim 36 is allowable over the teachings of Rothberg.

Claim 37 is dependent on the independent Claim 31. Claim 37 requires that the step mathematically generating the comparison string further comprises restarting the step of mathematically generating the comparison string if the iteration has become unbounded. The Examiner suggests that Rothberg teaches the elements of Claim 37. (col. 18, lines 55-67 and col. 19, lines 1-6). The applicant respectfully disagrees. As discussed above, Rothberg does not teach a comparison string generated by a mathematical iterative function. The closest the discussion in Rothberg gets to a discussion of numbers in these lines is discussion of decreasing temperature. There is no discussion in these lines of unbounded iterations. Thus, Rothberg does not teach that the step mathematically generating the comparison string further comprises restarting the step of mathematically generating the comparison string if the iteration has become unbounded, as required by Claim 37. For at least this reason, the dependent Claim 37 is allowable over the teachings of Rothberg.

Claim 38 is dependent on the independent Claim 31. Claim 38 requires that the step of mathematically generating the comparison string further comprises a comparison string of any length. The Examiner suggests that Rothberg teaches the elements of Claim 38. (col. 18, lines 8-38). The applicant respectfully disagrees. Rothberg teaches searching for the length between occurrences of a nucleotide sequence in a database. (col. 18, lines 14-18 and 22-24). Rothberg does not discuss the lengths of subsequences in these lines. Thus, Rothberg does not teach that the step of mathematically generating the comparison string further comprises a comparison string of any length, as required by Claim 38. For at least this reason, the dependent Claim 38 is allowable over the teachings of Rothberg.

Claim 39 is dependent on the independent Claim 31. Claim 39 requires that the step of comparing comprises scoring of the comparison string by evaluating a function having the

comparison string and one of the plurality of target strings as inputs, such that the evaluation may be repeated for other of the number of the target strings. The Examiner suggests that Rothberg teaches the elements of Claim 39. (col. 20, lines 54-67 and col. 21, lines 1-19). The applicant respectfully disagrees that these lines state what the Examiner suggests. Rothberg teaches physical manipulation of nucleotide sequence fragments in these lines. In more detail, Rothberg teaches the steps of digesting a sample into fragments, contacting fragments with other types of nucleotides, ligating or tying longer nucleotides to fragments, extending ligated fragments, amplifying fragments, determining length of fragments, searching a database of DNA sequences. (col. 20, lines 54-67 and col. 21, lines 1-19). These steps do not involve evaluation of a mathematical function. Further, as discussed above, Rothberg does not teach a comparison string. Further, Rothberg does not teach the evaluation of a function in these lines. Thus, Rothberg does not teach evaluating a function having a comparison string as an input. Therefore, Rothberg does not teach that the step of comparing comprises scoring of the comparison string by evaluating a function having the comparison string and one of the plurality of target strings as inputs, such that the evaluation may be repeated for other of the number of the target strings, as required by Claim 39. For at least this reason, the dependent Claim 39 is allowable over the teachings of Rothberg.

Claim 40 is dependent on the dependent Claim 39. Claim 40 requires that the scoring of the comparison string comprises placing a mark on the point in the multidimensional map if the score or some other property corresponding to the point meets some relevant criteria. The Examiner suggests that Rothberg teaches the elements of Claim 40. (col. 70, lines 15-40). The applicant respectfully disagrees. Rothberg teaches scoring of sequences. As discussed above, however, Rothberg teaches neither a multidimensional map or a point in the multidimensional map. Thus, Rothberg teaches neither a scoring process that determines if a point meets some relevant criteria nor placing a mark on the point in the map. For the present invention, certain properties of the comparison string might be marked, and examples of properties that might be marked are the mean value of the comparison string or the Shannon entropy. (Specification, page 5, lines 24-26). As discussed above, however, Rothberg does not teach a comparison string, as required by the present

invention. Therefore, Rothberg does not teach that the scoring of the comparison string comprises placing a mark on the point in the multidimensional map if the score or some other property corresponding to the point meets some relevant criteria, as required by Claim 40. For at least this reason, the dependent Claim 40 is allowable over the teachings of Rothberg.

Claim 41 is dependent on the dependent Claim 40. Claim 41 requires that the criteria comprises the comparison string having the highest score, where the score is based on some similarity measure to the target string. The Examiner suggests that Rothberg teaches the elements of Claim 41. (col. 18, lines 8-38 and col. 70, lines 15-40). The applicant respectfully disagrees. Rothberg teaches searching for the length between occurrences of a nucleotide sequence in a database. (col. 18, lines 14-18 and 22-24). Rothberg does not discuss scoring of subsequences in these lines. Rothberg does teach scoring of subsequences, however. (col. 70, lines 15-40). As discussed above, however, Rothberg does not teach a comparison string. Thus, Rothberg can not teach a comparison string having a highest score. Therefore, Rothberg does not teach that the criteria comprises the comparison string having the highest score, where the score is based on some similarity measure to the target string, as required by Claim 41. For at least this reason, the dependent Claim 41 is allowable over the teachings of Rothberg.

Claim 42 is dependent on the on the independent Claim 31. Claim 42 requires that the scoring of the comparison string further comprises preliminary testing of properties of the comparison string alone as criteria to initiate scoring. The Examiner suggests that Rothberg teaches the elements of Claim 42. (col. 16, lines 48-67 and col. 70, lines 15-40). The applicant respectfully disagrees. Rothberg teaches that a sample sequence is probed by recognition means to recognize target nucleotide subsequences, from which signals are created and sent to a programmable apparatus for analyzing the signals. (col. 16, lines 49-55). Rothberg does not teach scoring in these lines. Rothberg, however, does teach scoring of subsequences but does not teach preliminary testing of properties of strings, or subsequences. (col. 70, lines 15-40). Further, as discussed above, Rothberg does not teach a comparison string. Thus, Rothberg can not teach testing of properties of the comparison string. Therefore, Rothberg does not teach that the scoring of the comparison

string further comprises preliminary testing of properties of the comparison string alone as criteria to initiate scoring, as required by Claim 42. For at least this reason, the dependent Claim 42 is allowable over the teachings of Rothberg.

Claim 43 is dependent on the dependent Claim 39. Claim 43 requires that scoring of the comparison string comprises a test of the comparison string using the target string. The Examiner suggests that Rothberg teaches the elements of Claim 43. (col. 60, lines 26-48 and col. 1 lines 16-21). The applicant respectfully disagrees. Rothberg teaches DNA sequence classification, comparison of expression, or identification of preferably all DNA sequences in a sample without performing any sequencing. (col. 1, lines 16-21). Rothberg does not teach scoring of sequences in these lines. Rothberg also teaches that for likely DNA sequences in an analyzed sample, simulated methods determine a pattern of simulated signals in a simulated database. (col. 60, lines 26-48). Rothberg does not teach scoring of sequences in these lines. Further, as discussed above, Rothberg does not teach a comparison string. Thus, Rothberg can not teach a test of the comparison string using the target string. Therefore, Rothberg does not teach that scoring of the comparison string comprises a test of the comparison string using the target string, as required by Claim 43. For at least this reason, the dependent Claim 43 is allowable over the teachings of Rothberg.

Claim 44 is dependent on the dependent Claim 43. Claim 44 requires that not all of the numbers in the comparison string or the target string must be used in the test. The Examiner suggests that Rothberg teaches the elements of Claim 44. (col. 37, lines 1-42). The applicant respectfully disagrees. Rothberg teaches detection and classification of quantitative expression analysis signal patterns. Rothberg does not teach scoring of subsequences in these lines. Further, as discussed above, Rothberg does not teach a comparison string. Therefore, Rothberg does not teach that not all of the numbers in the comparison string or the target string must be used in the test, as required by Claim 44. For at least this reason, the dependent Claim 44 is allowable over the teachings of Rothberg.

Claim 45 is dependent on the dependent Claim 39. Claim 45 requires that scoring of the comparison string further comprises a one-to-one comparison between corresponding numbers in

the target string and the comparison string. The Examiner suggests that Rothberg teaches the elements of Claim 45. (col. 70, lines 15-40 and col. 30, lines 54-65). The applicant respectfully disagrees. Rothberg teaches amplification and detection of subsequence fragments. (col. 30, lines 54-65). Rothberg does not teach scoring of subsequences in these lines. Rothberg, however, does teach scoring of subsequences. (col. 70, lines 15-40). As discussed above, though, Rothberg does not teach a comparison string. Thus, Rothberg can not teach a one-to-one comparison between a comparison string and some other string. Therefore, Rothberg does not teach that scoring of the comparison string further comprises a one-to-one comparison between corresponding numbers in the target string and the comparison string, as required by Claim 45. For at least this reason, the dependent Claim 45 is allowable over the teachings of Rothberg.

Claim 46 is dependent on the dependent Claim 45. Claim 46 requires that the one-to-one comparison may be between corresponding sequential or non-sequential numbers in the target string and the comparison string. The Examiner suggests that Rothberg teaches the elements of Claim 46. (col. 37, lines 44-58). The applicant respectfully disagrees. Rothberg teaches that the selection of target subsequences is an important part of the invention. Rothberg does not teach scoring of subsequences in these lines. Further, as discussed above, Rothberg does not teach a comparison string. Therefore, Rothberg does not teach that the one-to-one comparison may be between corresponding sequential or non-sequential numbers in the target string and the comparison string, as required by Claim 46. For at least this reason, the dependent Claim 46 is allowable over the teachings of Rothberg.

Claim 47 is dependent on the dependent Claim 39. Claim 47 requires that scoring of the comparison string further comprises studying the behavior of the scoring function, such as determining the function's minima and maxima. The Examiner suggests that Rothberg teaches the elements of Claim 47. (col. 30, lines 54-65 and col. 37, lines 44-58 and col. 70, lines 15-40). The applicant respectfully disagrees. Rothberg teaches amplification and detection of subsequence fragments. (col. 30, lines 54-65). Rothberg does not teach scoring of subsequences in these lines, however. Further, Rothberg teaches that the selection of target subsequences is an important part

of the invention. (col. 37, lines 44-58). Here, too, Rothberg does not teach scoring of subsequence. Rothberg does teach scoring of subsequences, but does not teach studying the behavior of the scoring function. (col. 70, lines 15-40). Further, as discussed above, Rothberg does not teach a comparison string. Therefore, Rothberg does not teach that scoring of the comparison string further comprises studying the behavior of the scoring function, such as determining the function's minima and maxima, as required by Claim 47. For at least this reason, the dependent Claim 47 is allowable over the teachings of Rothberg.

Claim 48 is dependent on the dependent Claim 39. Claim 48 requires that only the comparison string is used as relevant input to the scoring function. The Examiner suggests that Rothberg teaches the elements of Claim 48. (col. 16, lines 48-67 and col. 70, lines 15-40). The applicant respectfully disagrees. Rothberg teaches that a sample sequence is probed by recognition means to recognize target nucleotide subsequences, from which signals are created and sent to a programmable apparatus for analyzing the signals. (col. 16, lines 49-55). Rothberg does not teach scoring in these lines. Rothberg, however, does teach scoring of subsequences but does not teach any information about inputs into the scoring function. (col. 70, lines 15-40). Further, as discussed above, Rothberg does not teach a comparison string. Therefore, Rothberg does not teach that only the comparison string is used as relevant input to the scoring function, as required by Claim 48. For at least this reason, the dependent Claim 48 is allowable over the teachings of Rothberg.

Claim 49 is dependent on the independent Claim 31. Claim 49 requires that placing a mark on the point in the multidimensional map comprises storing the coordinates of the point corresponding to the target string or properties of the comparison string in memory, a database or a table. The Examiner suggest that Rothberg teaches the elements of Claim 49. (col. 16, lines 48-67 and col. 17, lines 1-21). The applicant respectfully disagrees. Therefore, Rothberg does not teach that placing a mark on the point in the multidimensional map comprises storing the coordinates of the point corresponding to the target string or properties of the comparison string in memory, a database or a table, as required by Claim 49. For at least this reason, the dependent Claim 49 is allowable over the teachings of Rothberg.

Claim 59 is dependent on the independent Claim 31. Claim 59 requires that the uses for the method comprise analyzing large datasets, such as for DNA sequence data, protein sequence data, gene expression datasets, demographic data, statistical data, and clinical (patient) data. The Examiner suggests that Rothberg teaches the elements of Claim 59. (col. 5, lines 52-67 and col. 6, lines 1-43). The applicant respectfully disagrees. As discussed above, because Rothberg does not teach a comparison string, the method of Rothberg is not the same as the method of the present invention. Therefore, Rothberg does not teach that the uses for the method comprise analyzing large datasets, such as for DNA sequence data, protein sequence data, gene expression datasets, demographic data, statistical data, and clinical (patient) data, as required by Claim 59. For at least this reason, the dependent Claim 59 is allowable over the teachings of Rothberg.

Claim 60 is dependent on the independent Claim 31. Claim 60 requires that the uses of the method comprise analyzing datasets consisting of heterogenous data, such as both gene expression data and clinical (patient) data. The Examiner suggests that Rothberg teaches the elements of Claim 60. (col. 5, lines 52-67 and col. 6, lines 1-43). The applicant respectfully disagrees. Rothberg teaches analyzing different types of genes, such as oncogenes, tumor suppressor genes, growth factors, cell cycle gene, cytoskeletal genes, etc. (col. 5, lines 57-62). This group of genes is homogenous because all elements of the group are genes. Rothberg does not teach analyzing datasets consisting of heterogenous data, such as genes along with other types of datasets, such as clinical (patient) data or statistical data. Therefore, Rothberg does not teach that the uses of the method comprise analyzing datasets consisting of heterogenous data, such as both gene expression data and clinical (patient) data, as required by Claim 60. For at least this reason, the dependent Claim 60 is allowable over the teachings of Rothberg.

Claim 61 is dependent on the independent Claim 31. Claim 61 requires that the uses for the method comprise data compression. The Examiner suggests that Rothberg teaches the elements of Claim 61. (col. 43, lines 50-60). The applicant respectfully disagrees. Rothberg teaches a method for cutting subsequences having a compressed length distribution, or an excess of short fragments. The cutting of the physical subsequences is not data storage. Because Rothberg does not teach data

storage, it does not teach data compression. Therefore, Rothberg does not teach that the uses for the method comprise data compression, as required by Claim 61. For at least this reason, the dependent Claim 61 is allowable over the teachings of Rothberg.

Claim 62 is dependent on the independent Claim 31. Claim 62 requires that the steps may be automated. The Examiner suggests that Rothberg teaches the elements of Claim 62. (col. 34, lines 4-10 and figs 16A-D). The applicant respectfully disagrees. Rothberg teaches that oligomers may be synthesized by use of an automated DNA synthesizer. (col 34, lines 4-6). Rothberg, however, teaches that oligomers perform specific functions such as hybridization and chain elongation priming. These functions, however, are just a few of the functions performed in Rothberg. At least one other function that Rothberg teaches is that a sample sequence is probed by recognition means to recognize target nucleotide subsequences, from which signals are created and sent to a programmable apparatus for analyzing the signals. (col. 16, lines 49-55). Rothberg does not teach that this probing is automated. Therefore, Rothberg does not teach that the steps may be automated, as required by Claim 62. For at least this reason, the dependent Claim 62 is allowable over the teachings of Rothberg.

Claim 63 is dependent on the independent Claim 31. Claim 63 requires that separate processes involved in the steps of generating and comparing may be processed simultaneously by a plurality of processors. The Examiner suggests that Rothberg teaches the elements of Claim 63. (col. 77, lines 27-32). The applicant respectfully disagrees. As discussed above, Rothberg does not teach a comparison string. It follows that Rothberg does not teach processing the generation of a comparison string at the same time as scoring a comparison string. Therefore, Rothberg does not teach that separate processes involved in the steps of generating and comparing may be processed simultaneously by a plurality of processors, as required by Claim 63. For at least this reason, the dependent Claim 63 is allowable over the teachings of Rothberg.

Claim 64 is an independent claim. Claim 64 requires mathematically generating from a point in the multidimensional map a comparison string comprising a dataset using an iterative algorithm, such that the comparison string is calculated from a point in any set of points that can

serve as the domain of an iterative function. The Examiner suggests that Rothberg discloses sample sequence comprising a plurality of nucleic acids of database sequence is generated by recognition means. (col. 16, lines 52-67, col. 17, lines 1-20, col. 63, lines 24-32). The applicant respectfully disagrees that these lines state what the Examiner suggests. Instead, Rothberg teaches that a sample sequence is probed by recognition means to recognize target nucleotide subsequences, from which signals are created and sent to a programmable apparatus for analyzing the signals. (col. 16, lines 49-55). Rothberg teaches that the signals created from the nucleotide sequences are then compared to sequences in a database. (col. 17, lines 1-3). Basically, fragments of or patterns in sequences are generated from a sample sequence. The applicant respectfully disagrees that this is the same as some of the requirements of Claim 64. The Examiner suggests that the "target nucleotide subsequences" are analogous to the "comparison" strings of the present invention. The present invention does not generate comparison strings from nucleotide sequences. Comparison strings are neither a sample of nucleotide sequences, nor a nucleotide sequence, nor signals generated from nucleotide sequences. Further, Claim 64 requires a multidimensional map, which Rothberg does not teach. Thus, Rothberg does not teach mathematically generating from a point in a multidimensional map a comparison string, as required by Claim 64.

Claim 64 also requires comparing a number of the target strings with the comparison string to determine for each target string if a mark should be placed on the point in the multidimensional map corresponding to the comparison string. The Examiner suggests that Rothberg teaches recognition means causing comparing device to find any matches between one or more pattern from sample sequence with the target sequence such as DNA sequence. (col. 17, lines 20-36; also see fig. 9 and col. 64, lines 40-55). The applicant respectfully disagrees that these lines state what the Examiner suggests. Instead, Rothberg teaches a comparing device, which compares the actual signals from the generated target nucleotide subsequences to patterns of signals in a database. (col. 17, lines 23-30). The applicant also respectfully disagrees that this is the same as some of the requirements of Claim 64. Claim 64 does not require generating comparison strings from nucleotide sequences. Therefore, it follows that Claim 64 does not require comparing subsequences

to patterns of subsequences or signals to patterns of signals, as in Rothberg. Again, Claim 64 requires a multidimensional map, which Rothberg does not teach. Thus, Rothberg does not teach comparing a number of the target strings with the comparison string to determine for each target string if a mark should be placed on a point in the multidimensional map corresponding to the comparison string, as required by Claim 64.

The Examiner states that Rothberg does not clearly indicate a point in the map. The Examiner suggests that Rothberg discloses a pattern of signal as a point for the basis of comparison of sample and target sequences (col. 57, lines 20-36). The applicant respectfully disagrees that these lines state what the Examiner suggests. Col. 57, lines 20-36 make no mention of this subject, but instead discusses the intricacies of amplifying cDNA fragments (col. 55, lines 22, 23). Applicant believes Examiner meant col. 17, lines 20-36. In these lines, patterns of signals are generated by probing a sample of nucleotide sequences. As discussed above, the "point" in the present invention is a point in a multidimensional map. The point has coordinates. The point is not a pattern of signals from a nucleotide sequence, as in Rothberg. Further, Rothberg does not teach maps or points in maps. Thus, Rothberg does not teach the "point in a multidimensional map" as required by Claim 64.

Claim 64 also requires repeating the steps of mathematically generating and comparing for a plurality of comparison strings. The Examiner suggests that Rothberg teaches these elements of Claim 64. (col. 65, lines 1-32). The applicant respectfully disagrees. Rothberg does not teach a comparison string, and thus does not teach generating a comparison string or comparing a comparison string to target strings. Therefore, Rothberg does not teach repeating the steps of mathematically generating and comparing for a plurality of comparison strings, as required by Claim 64.

Rothberg does not teach mathematically generating from a point in the map a comparison string comprising a dataset using an iterative algorithm, such that the comparison string is calculated from a point in any set of points that can serve as the domain of an iterative function, as required by Claim 64. Further, Rothberg does not teach comparing a number of the target strings

with the comparison string to determine for each target string if a mark should be placed on the point in the multidimensional map corresponding to the comparison string. Further, Rothberg does not teach the steps of mathematically generating and comparing for a plurality of comparison strings, as required by Claim 64. For at least these reasons, the independent Claim 64 is allowable over the teachings of Rothberg.

Claim 65 is an independent claim. Claim 65 requires mathematically generating from a point in the multidimensional map a comparison string comprising a dataset. The Examiner suggests that Rothberg discloses sample sequence comprising a plurality of nucleic acids of database sequence is generated by recognition means. (col. 16, lines 52-67, col. 17, lines 1-20, col. 63, lines 24-32). The applicant respectfully disagrees that these lines state what the Examiner suggests. Instead, Rothberg teaches that a sample sequence is probed by recognition means to recognize target nucleotide subsequences, from which signals are created and sent to a programmable apparatus for analyzing the signals. (col. 16, lines 49-55). Rothberg teaches that the signals created from the nucleotide sequences are then compared to sequences in a database. (col. 17, lines 1-3). Basically, fragments of or patterns in sequences are generated from a sample sequence. The applicant respectfully disagrees that this is the same as some of the requirements of Claim 65. The Examiner suggests that the "target nucleotide subsequences" are analogous to the "comparison" strings of the present invention. The present invention does not generate comparison strings from nucleotide sequences. Comparison strings are neither a sample of nucleotide sequences, nor a nucleotide sequence, nor signals generated from nucleotide sequences. Further, Claim 65 requires a multidimensional map, which Rothberg does not teach. Thus, Rothberg does not teach mathematically generating from a point in a multidimensional map a comparison string, as required by Claim 65.

Claim 65 also requires scoring of the comparison string by evaluating a function having the comparison string and one of the target strings as inputs, such that the evaluation may be repeated for a number of the other target strings, to determine for each target string if a mark should be placed on the point in the multidimensional map corresponding to the comparison string. The

Examiner suggests that Rothberg teaches scoring metric comprising the comparison signals as comparison string. (col. 70, lines 15-40). The applicant respectfully disagrees. As discussed above, Rothberg teaches neither a comparison string, a multidimensional map, nor a point in the multidimensional map. Thus, Rothberg does not teach scoring of a comparison string. Further, Rothberg does not teach determining if a point should be placed on the point in the map corresponding to the comparison string. Thus, Rothberg does not teach comparing a number of the target strings with the comparison string to determine for each target string if a mark should be placed on a point in the multidimensional map corresponding to the comparison string, as required by Claim 65.

The Examiner states that Rothberg does not clearly indicate a point in the map. The Examiner suggests that Rothberg discloses a pattern of signal as a point for the basis of comparison of sample and target sequences (col. 57, lines 20-36). The applicant respectfully disagrees that these lines state what the Examiner suggests. Col. 57, lines 20-36 make no mention of this subject, but instead discusses the intricacies of amplifying cDNA fragments (col. 55, lines 22, 23). Applicant believes Examiner meant col. 17, lines 20-36. In these lines, patterns of signals are generated by probing a sample of nucleotide sequences. As discussed above, the "point" in the present invention is a point in a multidimensional map. The point has coordinates. The point is not a pattern of signals from a nucleotide sequence, as in Rothberg. Further, Rothberg does not teach maps or points in maps. Thus, Rothberg does not teach the "point in a multidimensional map" as required by Claim 65.

Claim 65 also requires repeating the steps of generating and scoring for a plurality of comparison strings. The Examiner suggests that Rothberg teaches these elements of Claim 65. (col. 65, lines 1-32). The applicant respectfully disagrees. Rothberg does not teach a comparison string, and thus does not teach generating a comparison string or comparing a comparison string to target strings. Therefore, Rothberg does not teach repeating the steps of generating and scoring for a plurality of comparison strings, as required by Claim 65.

Rothberg does not teach mathematically generating from a point in the multidimensional map a comparison string comprising a dataset, as required by Claim 65. Further, Rothberg does not teach comparing a number of the target strings with the comparison string to determine for each target string if a mark should be placed on the point in the multidimensional map corresponding to the comparison string. Further, Rothberg does not teach the steps of mathematically generating and scoring for a plurality of comparison strings, as required by Claim 65. For at least these reasons, the independent Claim 65 is allowable over the teachings of Rothberg.

Claim 66 is essentially the same as Claim 31 except that it is directed to a system rather than a method. Claim 66 is allowable for the same reasons Claim 31 is allowable over the teachings of Rothberg hereinabove.

Claim 67 is essentially the same as Claim 32 except that it is directed to a system rather than a method. Claim 67 is allowable for the same reasons Claim 32 is allowable over the teachings of Rothberg hereinabove.

Claims 70-73 are essentially the same as Claims 35-38 except that they are directed to a system rather than a method. Claims 70-73 are allowable for the same reasons Claims 35-38 are allowable over the teachings of Rothberg hereinabove.

Claims 74-83 are essentially the same as Claims 39-48 except that they are directed to a system rather than a method. Claims 74-83 are allowable for the same reasons Claims 39-48 are allowable over the teachings of Rothberg hereinabove.

Claim 84 is essentially the same as Claim 49 except that it is directed to a system rather than a method. Claim 84 is allowable for the same reasons Claim 49 is allowable over the teachings of Rothberg hereinabove.

Claims 85-96 are essentially the same as Claims 50-53, 55-61 and 63 except that they are directed to a system rather than a method. Claims 85-96 are allowable for the same reasons Claims 50-53, 55-61 and 63 are allowable over the teachings of Rothberg hereinabove.

Claims 33-34, 50-52, 68-69 and 85-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,141,657 issued to Rothberg et al. (hereinafter Rothberg) in

view of U.S. Patent No. 5,416,848 issued to Young. The applicant respectfully traverses the rejection by demonstrating below that Rothberg in view of Young do not anticipate the applicant's invention.

Young teaches a method of efficiently ordering certain kinds of color and pattern information on fractal surfaces.

Claim 33 is dependent on the independent Claim 31. Claim 33 requires that the set of points comprises a region of the complex plane. The Examiner states that Rothberg does not explicitly indicate a region of the complex plane. The Examiner suggests that Young discloses a dynamic map including points on the complex plane. The applicant respectfully disagrees. Young teaches generation of images that represent a Mandelbrot set. (col. 7, lines 18-22). Similarly, Young teaches a technique for expressing a Julia set visually on a map, wherein each point of the Julia set is coded as black or white. (col. 4, lines 35-40). Mandelbrot and Julia Sets are know to be a region of the complex plane. Young, however, teaches a completely different use of the map than in the present invention. The present invention, on the other hand, provides a modeling technique used for data analysis. An iterative algorithm is used to generate a comparison string from a point in the complex plane of a multidimensional map. Young does not teach generating a comparison string from a point in the map. Further, Young does not teach data analysis through use of the complex plane. Thus Young, does not teach that the set of points comprises a region in the complex plane, as required by Claim 33. For at least this reason, the dependent Claim 34 is allowable over the teachings of Rothberg in view of Young.

Claim 34 is dependent on the dependent Claim 33. Claim 34 requires that the set of points further comprises points in and/or near the Mandelbrot Set or a Julia Set. The Examiner states that Rothberg does not explicitly indicate points in and/or near the Mandelbrot Set or a Julia Set. The Examiner suggests that Young teaches the elements of Claim 34. The applicant respectfully disagrees. Young teaches generation of images that represent a Mandelbrot set. (col. 7, lines 18-22). Similarly, Young teaches a technique for expressing a Julia set visually on a map, wherein each point of the Julia set is coded as black or white. (col. 4, lines 35-40). As discussed above,

Young teaches a different use of the Mandelbrot and Julia Sets than in the present invention. The present invention provides a modeling technique used for data analysis. An iterative algorithm is used to generate a comparison string from a point in and/or near the Mandelbrot Set or Julia Set of a multidimensional map. Young does not teach generating a comparison string from a point in the map. Further, Young does not teach data analysis through use of a Mandelbrot or Julia Set. Thus Young, does not teach that the set of points further comprises points in and/or near the Mandelbrot Set or a Julia Set, as required by Claim 34. For at least this reason, the dependent Claim 34 is allowable over the teachings of Rothberg in view of Young.

Claim 50 is dependent on the independent Claim 31. Claim 50 requires that placing a mark on a point in the multidimensional map comprises placing a mark on a point in a video display by changing some graphical property of the corresponding pixel, such as color. The Examiner states that Rothberg does not explicitly indicate the elements of Claim 50. The Examiner suggests that Young teaches the elements of Claim 50. The applicant respectfully disagrees. As discussed above, Young does not teach generating a comparison string from a point in the map. The video display for the present invention displays the multidimensional map. Thus, the point marked on the video screen of the present invention is the same point that would be marked on the map. Therefore, Young does not teach that placing a mark on a point in the multidimensional map comprises placing a mark on a point in a video display by changing some graphical property of the corresponding pixel, such as color, as required by Claim 50. For at least this reason, the dependent Claim 50 is allowable over the teachings of Rothberg in view of Young.

Claim 51 is dependent on the independent Claim 31. Claim 51 requires an additional step of examining a plurality of subregions of the multidimensional map with higher resolution. The Examiner states that Rothberg does not explicitly indicate the elements of Claim 51. The Examiner suggests that Young teaches the elements of Claim 51. The applicant respectfully disagrees. Young teaches a method for the input of a source image from a photograph, painting, etc., and freezing the image in memory. (col. 6, lines 28-60). Young also teaches processes for creating a colorized map file and presenting the colorized map file. (col. 7, lines 41-60 and col. 5, lines 55-67 and col. 6,

lines 1-11). Young, however, does not teach examining subregions of a map. Young teaches a high-resolution twenty-four-bit graphics color printer, but does not teach examining subregions of a map with higher resolution. (col. 7, lines 33-34). Therefore, Young does not teach an additional step of examining a plurality of subregions of the multidimensional map with higher resolution, as required by Claim 51. For at least this reason, the dependent Claim 51 is allowable over the teachings of Rothberg in view of Young.

Claim 52 is dependent on the dependent Claim 51. Claim 52 requires that the step of examining a subregion comprises reformatting of the target and/or comparison string in order to improve the precision and resolution of the method. The Examiner states that Rothberg does not explicitly indicate the elements of Claim 52. The Examiner suggests that Young teaches the elements of Claim 52. The applicant respectfully disagrees. As discusses above, Young does not teach examining subregions of a map with higher resolution. Further, Young does not teach generation of comparison strings from a point in a multidimensional map. It follows that Young does not teach reformatting of a comparison string. Therefore, Young does not teach that the step of examining a subregion comprises reformatting of the target and/or comparison string in order to improve the precision and resolution of the method, as required by Claim 52. For at least this reason, the dependent Claim 52 is allowable over the teachings of Rothberg in view of Young.

Claims 68-69 are essentially the same as Claims 33-34 except that they are directed to a system rather than a method. Claims 68-69 are allowable for the same reasons Claims 33-34 are allowable over the teachings of Rothberg in view of Young hereinabove.

Claims 85-87 are essentially the same as Claims 50-52 except that they are directed to a system rather than a method. Claims 85-87 are allowable for the same reasons Claims 50-52 are allowable over the teachings of Rothberg in view of Young hereinabove.

Claims 53-54 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,141,657 to Rothberg et al. (hereinafter Rothberg) in view of U.S. Patent No. 5,416,848 issued to Young and further in view of U.S. Patent No. 6,389,428 to Rigault et al. (hereinafter

Rigault). The applicant respectfully traverses the rejection by demonstrating below that Rothberg in view of Young, and further in view of Rigault do not anticipate the applicant's invention.

Rigault teaches a computer system that stores biomolecular data in a database in a memory. Rigault uses a search algorithm such as Basic Alignment Search Tool (BLAST) to compare a sequence of nucleotides with all sequences in a given database. BLAST looks for similarity matches, or 'hits', that indicate the potential identity and function of the gene. Thus, Rigault teaches a data analysis technique, in which some operation is performed on a large number of datasets (e.g. DNA sequences) in order to highlight the similarities and differences between the datasets.

Claim 53 is dependent on the dependent Claim 52. Claim 53 requires that the step of examining a subregion comprises a reformatting process methodology based on methodologies such as Simulated Annealing, Hill Climbing Algorithms, Genetic Algorithms, or Evolutionary Programming Methods. The Examiner states that Rothberg in view of Young does not indicate the elements of Claim 53. The Examiner suggests that Rigault teaches the elements of Claim 53. The applicant respectfully disagrees. Rigault teaches search algorithms such as BLAST. (col. 1, lines 55-60). Rigault also teaches computational algorithms in order to compare DNA sequences. (col. 1, lines 33-35). Both of these algorithms, however, are not the same as reformatting process methodology. The reformatting process involves re-scaling a subregion of a map to improve the precision and resolution of the mapping and marking process as zooming is performed. (Specification, page 9, lines 6-9). Rigault also teaches clone name mapping arrays. (col. 7, lines 60-67). Again, these arrays are not the same thing as a reformatting process. In the Examiners first Office Action, the Examiner states that Rigault does not explicitly the elements of Claim 51, which requires an additional step of examining a plurality of subregions of the map with higher resolution. Because Rigault does not teach examining subregions, Rigault does not teach reformatting process methodologies for this purpose. Therefore, Rigault does not teach that the step of examining a subregion comprises a reformatting process methodology based on methodologies such as Simulated Annealing, Hill Climbing Algorithms, Genetic Algorithms, or Evolutionary

Programming Methods, as required by Claim 53. For at least this reason, the dependent Claim 53 is allowable over the teachings of Rothberg in view of Young, and further in view of Rigault.

Claim 54 is dependent on the dependent Claim 53. Claim 54 requires that the reformatting process is automated. The Examiner states that Rothberg in view of Young does not indicate the elements of Claim 54. The Examiner suggests that Rigault teaches the elements of Claim 54. The applicant respectfully disagrees. As discussed above, Rigault does not teach a reformatting process, which involves re-scaling of a subregion of a map while zooming in on the map. Rigault instead teaches that the system switches between servers if one becomes available. (col. 4, lines 10-11). Switching between systems is not the same thing as the automating a reformatting process. Further, Rigault teaches storing sequences information in a precompiled format which allows for rapid retrieval of the information. Again, rapid retrieval of stored information is not the same thing as automating a reformatting process. Therefore, Rigault does not teach that the reformatting process is automated, as required by Claim 53. For at least this reason, the dependent Claim 53 is allowable over the teachings of Rothberg in view of Young, and further in view of Rigault.

Claim 88 is essentially the same as Claim 53 except that it is directed to a system rather than a method. Claim 88 is allowable for the same reasons Claim 53 is allowable over the teachings of Rothberg in view of Young, and further in view of Rigault hereinabove.

Claims 55-58 and 89-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,141,657 to Rothberg et al. (hereinafter Rothberg) in view of U.S. Patent No. 5,416,848 issued to Young and further in view of U.S. Patent No. 6,453,246 to Agrafiotis et al. (hereinafter Agrafiotis). The applicant respectfully traverses the rejection by demonstrating below that Rothberg in view of Young, and further in view of Agrafiotis do not anticipate the applicant's invention.

Agrafiotis teaches a system, method and computer program product for representing precise or imprecise measurements of similarity/dissimilarity (relationships) between objects as distances between points in a multi-dimensional space that represents the objects. Thus, Agrafiotis teaches a self-organizing map, a data analysis technique.

Claim 55 is dependent on the dependent Claim 51. Because Claim 51 is an allowable claim, Claim 55 is also allowable as being dependent on an allowable base claim.

Claim 56 is dependent on the independent Claim 51. Because Claim 51 is an allowable claim, Claim 56 is also allowable as being dependent on an allowable base claim.

Claim 57 is dependent on the dependent Claim 56. Because Claim 56 is an allowable claim, Claim 57 is also allowable as being dependent on an allowable base claim.

Claim 58 is dependent on the dependent Claim 51. Claim 58 requires that the step of examining a subregion further comprises repeating the examining step for smaller subregions. The Examiner states that Rothberg in view of Young does not explicitly teach the elements of Claim 58. The Examiner suggests that Agrafiotis teaches the elements of Claim 58. The applicant respectfully disagrees. Agrafiotis teaches utilizing any display attribute to represent similarity/dissimilarity between objects, including but not limited to size. For example, the similarity/dissimilarity between two objects may be represented by the relative sizes of points that represent the objects (col. 4, lines 11-21). The present invention, on the other hand, instead uses 'zooming.' The subregion of R replaces the previous region R in selecting region R. (Specification, page 8, lines 17-18). Representing relative sizes of points of Agrafiotis is not the same as examining smaller subregions of a region, as required by Claim 58. Agrafiotis also teaches allowed ranges for a given pair-wise relationship and the current distance of the corresponding images on the display map. If the distance does not fall within the allowed ranges, the images on the display map are corrected and either come closer together or become more distant. (col. 9, lines 29-41). Correcting images on a display map, causing images to come closer together, is not the same as examining smaller subregions, as required by Claim 58. Therefore, Agrafiotis does not teach that the step of examining a subregion comprises repeating the examining step for smaller subregions, as required by Claim 58. For at least this reason, the dependent Claim 58 is allowable over the teachings of Rothberg in view of Young, and further view of Agrafiotis.

Claims 89-92 are essentially the same as Claims 55-58 except that they are directed to a system rather than a method. Claims 89-92 are allowable for the same reasons Claims 55-58 are allowable over the teachings of Rothberg in view of Young, and further in view of Agrafiotis hereinabove.

CONCLUSION

For the reasons given above, the applicant submits that the claims, as amended, are now in a condition for allowance, and allowance at an early date would be appreciated. A Request for Continued Examination fee and a three-month extension of time fee have been paid for by credit card. Credit card form PTO-2038 has been included with this response.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**."

Should the Examiner have any questions or comments, he is encouraged to call the undersigned at (415) 334-2260 to discuss the same so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,

Julie E. Daniels

Date April 5, 2004

Julie E. Daniels
Reg. No. 51,330

I Sandy Shaw, Applicant/Inventor of the Application #09/766,247 "A Method for the Manipulation, Storage, Modeling, Visualization and Quantification of Datasets" appoint Julie E. Daniels to respond to the final office action dated October 6, 2003 on my behalf.

Signed _____

Date 04/05/04

If there are any questions or issues with the appointment of Julie E. Daniels please contact myself at 415-572-8126.

Version with Markings to Show Changes Made

IN THE CLAIMS

Please amend the claims as follows:

31. (Amended) A method for dataset pattern analysis for a plurality of ~~one or more~~ target strings, wherein each target string is a dataset and the target strings can be represented by placing marks on points in a multidimensional map such that patterns within each point or between points are extracted visually or mathematically, the method comprising the following steps:

mathematically generating from a point in the multidimensional map a comparison string comprising a dataset;

comparing a number of the target strings with the comparison string to determine for each target string if a mark should be placed on the point in the multidimensional map corresponding to the comparison string; and

repeating the steps of mathematically generating and comparing for a plurality of comparison strings.

32. (Amended) The method of claim 31, wherein the step of mathematically generating the comparison string comprises using an iterative algorithm, such that the comparison string is calculated from a point in any set of points that can serve as the domain of an iterative function.

35. (Amended) The method of claim 31 wherein the step of mathematically generating the comparison string further comprises transforming the numbers of the comparison string to have values within a set of interest.

36. (Amended) The method of claim 31, wherein the step of mathematically generating the comparison string further comprises laying a grid over the points in the multidimensional map.

37. (Amended) The method of claim 31, wherein the step of mathematically generating the comparison string further comprises restarting the step of mathematically generating the comparison string if the iteration has become unbounded.

38. (Amended) The method of claim 31, wherein the step of mathematically generating the comparison string further comprises generating a comparison string of any length.

40. (Amended) The method of claim 39, wherein scoring of the comparison string comprises placing a mark on the point in the multidimensional map if the score or some other property corresponding to the point meets some relevant criteria.

49. (Amended) The method of claim 31, wherein placing a mark on the point in the multidimensional map comprises storing the coordinates of the point corresponding to the target string or properties of the comparison string in memory, a database or a table.

50. (Amended) The method of claim 31, wherein placing a mark on the point in the multidimensional map comprises placing a mark on a point in a video display by changing some graphical property of the corresponding pixel, such as color.

51. (Amended) The method of claim 31, further comprising:

examining a plurality of subregions of the multidimensional map with higher resolution.

64. (Amended) A method for dataset pattern analysis for a plurality of ~~one or more~~ target strings, wherein each target string is a dataset and the target strings can be represented by placing marks on points in a multidimensional map such that patterns within each point or between points are extracted visually or mathematically, the method comprising the following steps:

mathematically generating from a point in the multidimensional map a comparison string comprising a dataset using an iterative algorithm, such that the comparison string is calculated from a point in any set of points that can serve as the domain of an iterative function;

comparing a number of the target strings with the comparison string to determine for each target string if a mark should be placed on the point in the multidimensional map corresponding to the comparison string; and

repeating the steps of mathematically generating and comparing for a plurality of comparison strings.

65. (Amended) A method for dataset pattern analysis for a plurality of ~~one or more~~ target strings, wherein each target string is a dataset and the target strings can be represented by placing marks on points in a multidimensional map such that patterns within each point or between points are extracted visually or mathematically, the method comprising the following steps:

mathematically generating from a point in the multidimensional map a comparison string comprising a dataset;

scoring of the comparison string by evaluating a function having the comparison string and one of the target strings as inputs, such that the evaluation may be repeated for a number of the other target strings, to determine for each target string if a mark should be placed on the point in the multidimensional map corresponding to the comparison string; and

repeating the steps of mathematically generating and scoring ~~comparing~~ for a plurality of comparison strings.

66. (Amended) A system for dataset pattern analysis for a plurality of ~~one or more~~ target strings, wherein each target string is a dataset and the target strings can be represented by placement of marks on points in a multidimensional map such that patterns within each point or between points are extracted visually or mathematically, the system comprising the following:

means for mathematically generating from a point in the multidimensional map a comparison string comprising a dataset;

means for comparing a number of the target strings with the comparison string to determine for each target string if a mark should be placed on the point in the multidimensional map corresponding to the comparison string; and

means for repeating the means for mathematically generating and means for comparing for a plurality of comparison strings.

67. (Amended) The system of claim 66, wherein the means for mathematically generating the comparison string comprises means for using an iterative algorithm, such that the comparison string is calculated from a point in any set of points that can serve as the domain of an iterative function.

70. (Amended) The system of claim 66 wherein the means for mathematically generating the comparison string further comprises means for transforming the numbers of the comparison string to have values within a set of interest.

71. (Amended) The system of claim 66, wherein the means for mathematically generating the comparison string further comprises means for laying a grid over the points in the multidimensional map.

72. (Amended) The system of claim 66, wherein the means for mathematically generating the comparison string further comprises means for restarting the means for mathematically generating the comparison string if the iteration has become unbounded.

73. (Amended) The system of claim 66, wherein the means for mathematically generating the comparison string further comprises means for generating a comparison string of any length.

75. (Amended) The system of claim 74, wherein the means for scoring of the comparison string comprises means for placing a mark on the point in the multidimensional map if the score or some other property corresponding to the point meets some relevant criteria.

84. (Amended) The system of claim 66, wherein the mark placement on the point in the multidimensional map comprises means for storing the coordinates of the point corresponding to the target string or properties of the comparison string in memory, a database or a table.

85. (Amended) The system of claim 66, wherein the mark placement on the point in the multidimensional map comprises means for placing a mark on a point in a video display by changing some graphical property of the corresponding pixel, such as color.

86. (Amended) The system of claim 66, further comprising:

means for examining a plurality of subregions of the multidimensional map with higher resolution.